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Customer Number

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	GROSS, CHRISTOPHER L.	Confirm No.:	6151
Application No.:	10/680693	Group Art Unit:	1772
Filed:	October 7, 2003	Examiner:	William Watkins III
Title:	NON-WHITE CONSTRUCTION SURFACE		

DECLARATION OF DR. CHRISTOPHER L. GROSS UNDER 37 CFR §1.132

MAIL STOP: AF
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

1. I am a U.S. citizen and a resident of Lake Elmo, Minnesota.

2. I am employed by 3M Company and I am an inventor of U.S. Patent Application Serial No. 10/680,693, filed October 7, 2003, and titled NON-WHITE CONSTRUCTION SURFACE.

3. I have read and understood the Office Action for U.S. Patent Application Serial No. 10/680,693 mailed June 1, 2007.

4. I conducted testing of the claimed invention and the closest prior art (Example 1 is a roofing granule with a single coat of green IR reflecting pigment; Example 2 is the claimed invention; Example 3 is a standard green colored roofing granule; Example 4 is a dual coated granule of Example III of US 3,208,871 to Langseth) and compared the results following the teaching of the pending application serial number 10/680,693.

Example 1 – 1000 g of full grade granules were coated and fired. The slurry coating included the following components:

Raw Material	Grams
PD Sodium Silicate	34
Water	15
Ferro 10411 Golden Yellow	0.6
Ferro 10241 Forest Green	7
Snobrite Clay	15
Borax	1

The raw materials labeled "Ferro 10411 Golden Yellow" and "Ferro 10241 Forest Green" are NIR-reflecting pigments sold by the Ferro Corporation. The reflectivity of the fired granules was measured using the procedure described in the pending application serial number 10/680,693. The calculated direct solar reflectance was 15.0%.

Example 2 - 1000 g or full grade granules were coated and fired using the same slurry formulation as listed in Example 1. However, the full grade granules utilized in this experiment were commercially available white granules (3M Corporation, Product No. 9300). The calculated direct solar reflectance was 29.0%.

Example 3 – The reflectivity of commercially available standard green roofing granules (3M Corporation, Product No. 3700 utilizing standard chrome oxide, carbon black and phthalocyanine green pigments) was measured using the procedure described in the pending application serial number 10/680,693. The calculated direct solar reflectance was 8.5%.

Example 4 - 1000 g or full grade granules were prepared according to Example III of US 3,208,871 to Langseth, with the iron oxide (red) pigment replaced with the phthalocyanine green (green) pigments tested above. The undercoating included the following components:

Raw Material	**#/ton**
PD Sodium Silicate	60
Water	24
Titanium Dioxide – SMC1200	24
Phthalocyanine Green Presscake (Sunfast)	2
Clay – B-3	50

The reflectivity of three samples of the undercoated fired granules were measured using the procedure described in the pending application serial number 10/680,693. The calculated direct solar reflectance was 23.0%, 22.1% and 22.5%.

These undercoated granules where then overcoated according to Example III of US 3,208,871 to Langseth, with the iron oxide (red) pigment replaced with the green pigments utilized in Example 3 above – this green pigment included phthalocyanine green, chrome oxide and carbon black. The outer coating included the following components:

Raw Material	#/ton
PD Sodium Silicate	60
Water	20
Phthalocyanine Green Presscake (Sunfast)	1.9
Chrome Oxide 112	8
Carbon Black M-8452	0.1
Clay – B-3	10

The reflectivity of two samples of the over coated fired granules were measured using the procedure described in the pending application serial number 10/680,693. The calculated direct solar reflectance was 13.7%, 13.7%.

5. These results provide evidence that the claimed invention possesses unexpectedly improved direct solar reflectance over the closest prior art green roofing granules tested. It is unexpected that the addition of a reflective undercoat would increase the amount of solar reflectance by 14% points (from 15% to 29%) or that by replacing the outer pigment with an IR reflecting pigment would increase the amount of solar reflectance by 15% points (from 13.7% to 29 %) since replacing the single coated standard pigment with the IR reflecting pigment increased the amount of solar reflectance by only 6.5% points (from 8.5% to 15 %). It would be expected that replacing the pigment of dual coated Example III of US 3,208,871 to Langseth with an IR reflecting pigment would increase the solar reflectance by an additive amount of 6.5% points (from 13.7% to 20.2%) as illustrated by Example 1 and 3 above. The claimed invention more than doubles the expected amount of solar reflectance.

6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 2/15/08

By: ______________________

Christopher L. Gross